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HONEYWELL INTERNATIONAL INC.
101 COLUMBIA ROAD
P O BOX 2245
MORRISTOWN, NJ 07962-2245

EXAMINER	
OSBORNE, LUKE R	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 07/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/052,716	HETT, CHARLES L.	
	Examiner	Art Unit	
	Luke Osborne	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-35* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-35* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 January 2002* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12/2/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Status

Claims 1-35 are pending in the instant application.

Claims 1-35 stand rejected.

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 12/2/04 is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

2. Claim 30 objected to because of the following informalities:

Claim 30 is objected to because the phrase "substantially conformal presentation". There is no description or basis in the claim of what the presentation is substantially conformal to. Please see claim 25 which uses the same phrase but as recited it is clear that the display is substantially conformal to a known lighting display.

Appropriate correction is required.

The art rejections of the claim(s) listed above are applied as best understood in light of the objection discussed above.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-11, 13-16, 20-23, 28-30, 32-35 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent 5,745,054 to Wilkens et al. hereafter "Wilkens".

Regarding claim 1, Wilkens discloses an airport lighting aid simulation generator. See Figures 2, 3 and the corresponding portions of Wilkens's specification for this disclosure. In particular, Wilkens discloses "An airport lighting aid simulation generator, comprising:

- a means for receiving a plurality of navigation signals

> [FIGS. 3 and 4 are diagrams illustrating how runway bearing is computed according to the invention. The preferred embodiment is designed for use with an instrument landing system and is described below. Those skilled in the art understand that the invention may be adapted for use with any other landing system including satellite landing systems (e.g. GPS based landing systems) and microwave landing systems, and also with various aircraft navigation and sensor system configurations. (Column 3, line 65- Column 4, line 7)];

- a means for retrieving airport information from a database as a function of one or more of the navigation signals; [Glide path angle is derived from the on board ILS system and runway specific glide path data provide by either an on board data base or the pilot.(Column 4, lines 23-25)]

- a means for determining deviation from a glide path as a function of one or more of the navigation signals

[The ILS system provides deviation data representative of the angular deviation of the aircraft from the glide slope signal. The on board data base provides the angle of the glide slope angle of the specific approach being used. Adding the deviation angle and the glide slope angle yields the actual glide path angle of the aircraft.(Column 4, lines 23-31) and Navigation system (e.g. ILS) 62B provides glide slope deviation and localizer deviation data. (Column 6, lines 29-33)]; and

– a means for outputting a signal representative of the deviation from the glide path

[Glide path angle is derived from the on board ILS system and runway specific glide path data provide by either an on board data base or the pilot.(Column 4, lines 23-25)]" as claimed.

Regarding claim 2, Wilkens discloses the generator of claim 1, "further comprising a means for visually displaying the deviation from the glide path as a function of the deviation signal [Display 60 is illustrated as a head up display having an overhead unit portion 60A, a brightness control 60B, and a combiner 60C (also generically referred to as a display screen). (Column 6, lines 9-18)]" as claimed.

Regarding claim 3, Wilkens discloses the generator of claim 2, "wherein the displaying means further comprises means for displaying the deviation as a pattern of color coded indicators [Display 60 is illustrated as a head up display having an overhead unit portion 60A, a brightness control 60B, and a combiner 60C (also generically referred to as a display screen). (Column 6, lines 9-18)]" as claimed.

Regarding claim 4, Wilkens discloses the generator of claim 2, "wherein the displaying means further comprises means for displaying information as to the degree

of deviation from the glide path [Navigation system (e.g. ILS) 62B provides glide slope deviation and localizer deviation data. (Column 6, lines 29-33)]" as claimed.

Regarding claim 5, Wilkens discloses the generator of claim 1, "wherein the means for determining deviation from a glide path further comprises means for generating the glide path [The data required for this computation are altitude above the runway(h), glide path angle, and runway length. Once this information is available, distance to end of runway(X) is computed as follows: (Column 4, lines 8-22)]" as claimed.

Regarding claim 6, Wilkens discloses the generator of claim 1, "wherein the means for determining deviation from a glide path further comprises means for retrieving the glide path from the database

> [Glide path angle is derived from the on board ILS system and runway specific glide path data provide by either an on board data base or the pilot. The ILS system provides deviation data representative of the angular deviation of the aircraft from the glide slope signal. The on board data base provides the angle of the glide slope angle of the specific approach being used. Adding the deviation angle and the glide slope angle yields the actual glide path angle of the aircraft. (Column 4, lines 23-31)]" as claimed.

Regarding claim 7, Wilkens discloses the generator of claim 1, "further comprising a means for updating the deviation over time [Y=X * d(tan (lat. dev. angle))/dt (Column 4, lines 42-61)]" as claimed.

Regarding claim 8, Wilkens discloses a simulated airport lighting aid generator. See Figures 2, 3 and the corresponding portions of Wilkens's specification for this

disclosure. In particular, Wilkens discloses "A simulated airport lighting aid generator, comprising:

– a processor structured to receive a plurality of navigation signals representative of a position and an altitude of a host aircraft [(Figure 6, item 61) Symbol generator processor];

– a signal generator operated by the processor, the generator being structured to retrieve airport information from a database as a function of the position signal, compare the position and altitude signals with a glide path, and output a signal representative of a degree of coincidence with the glide path as a function of the position and altitude signals [Navigation system (e.g. ILS) 62B provides glide slope deviation and localizer deviation data. (Column 6, lines 29-33)]; and

– a display structured to receive the signal output by the signal generator and responsively output a visual indication of the degree of coincidence with the glide path" as claimed.

Regarding claim 9, Wilkens discloses the generator of claim 8 "wherein the glide path further comprises one of the airport information retrieved from the database

> [Glide path angle is derived from the on board ILS system and runway specific glide path data provide by either an on board data base or the pilot. The ILS system provides deviation data representative of the angular deviation of the aircraft from the glide slope signal. The on board data base provides the angle of the glide slope angle of the specific approach being used. Adding the deviation angle and the glide slope angle yields the actual glide path angle of the aircraft. (Column 4, lines 23-31)]" as claimed.

Regarding claim 10, Wilkens discloses the generator of claim 8 "wherein the glide path further comprises a glide path generated by the signal generator as a function of the position signal and a portion of the airport information retrieved from the database [Navigation system (e.g. ILS) 62B provides glide slope deviation and localizer deviation data. (Column 6, lines 29-33)]" as claimed.

Regarding claim 11, Wilkens discloses the generator of claim 8 "wherein the indicators further comprise illuminated indicators positioned on a cockpit display [Glide path angle is derived from the on board ILS system and runway specific glide path data provide by either an on board data base or the pilot.(Column 4, lines 23-25)]" as claimed.

Regarding claim 13, Wilkens discloses the generator of claim 11 "wherein the indicators further comprise a pointer indicator programmed to provide information as to a change in altitude whereby the degree of coincidence with the glide path is increased [Display 60 is illustrated as a head up display having an overhead unit portion 60A, a brightness control 60B, and a combiner 60C (also generically referred to as a display screen) (Column 6, lines 9-18)]" as claimed.

Regarding claim 14 Wilkens discloses a glide path deviation generator. Figures 2, 3 and the corresponding portions of Wilkens's specification for this disclosure. In particular, Wilkens discloses "A glide path deviation generator, comprising:

– a memory having a stored database of airport information accessible as a function of position, the airport information including runway location, elevation and direction information [Database 62G provides runway length data and glideslope angle data. (Column 6, lines 39-40) Altitude(h) is computed from altitude data provided by an air data computer and airport elevation data provided from either the pilot, an on board data base (Column 4, lines 8-22)];

– a processor coupled to receive position and elevation data and coupled to the memory for retrieving the airport information as a function of the position, the processor being structured to operate a computer program for generating a glide path, comparing the position and elevation data to the glide path, and generating a signal representative of deviation of the position and elevation data from the glide path

[The ILS system provides deviation data representative of the angular deviation of the aircraft from the glide slope signal. The on board data base provides the angle of the glide slope angle of the specific approach being used. Adding the deviation angle and the glide slope angle yields the actual glide path angle of the aircraft.(Column 4, lines 23-31) and Navigation system (e.g. ILS) 62B provides glide slope deviation and localizer deviation data. (Column 6, lines 29-33)]; and

– a cockpit display being coupled to receive the deviation signal and being structured to display a pattern of color coded indicators as a function of the deviation signal [Display 60 is illustrated as a head up display having an overhead unit portion 60A, a brightness control 60B, and a combiner 60C (also generically referred to as a display screen) (Column 6, lines 9-18)]" as claimed.

Regarding claim 15, Wilkens discloses the generator of claim 14 "wherein operating a computer program for generating a glide path further comprises operating

the computer program as a function of the airport information to compute a glide path [The on board data base provides the angle of the glide slope angle of the specific approach being used. Adding the deviation angle and the glide slope angle yields the actual glide path angle of the aircraft (Column 4, lines 23-31)]" as claimed.

Regarding claim 16, Wilkens discloses the generator of claim 14 "wherein operating a computer program further comprises operating the computer program repeatedly for comparing updated position and elevation data to the glide path, and generating a signal representative of deviation of the updated position and elevation data from the glide path [The on board data base provides the angle of the glide slope angle of the specific approach being used. Adding the deviation angle and the glide slope angle yields the actual glide path angle of the aircraft (Column 4, lines 23-31)]" as claimed.

20. A computer program product for indicating deviation from a glide path, wherein the computer program product comprises:

- a computer-readable storage medium; and
- computer-readable program code means embodied in the medium, the computer-readable program code means comprising:
    - first computer-readable program code means for determining a global position from a received plurality of navigation data [Figure 6 item 62F: global positioning system (GPS) 62F],

- second computer-readable program code means for determining an altitude above ground level from one or more received navigation datum [Figure 6 items 62C, D],
- third computer-readable program code means for retrieving a plurality of airport information from a database of airport information as a function of the position determined from the first computer-readable program code means [Database 62G provides runway length data and glideslope angle data. (Column 6, lines 39-40)],
- fourth computer-readable program code means for determining correspondence between the position determined from the first computer-readable program code means combined with the altitude determined from the second computer-readable program code means and a glide path determined as a function of the airport information determined from the first computer-readable program code means [Figure 6, item 61], and
- fifth computer-readable program code means for outputting a signal as a function of the correspondence determined from the fourth computer-readable program code means [Figure 6, input into display 60]" as claimed.

Regarding claim 21, Wilkens discloses the computer program product of claim 20 "wherein the fourth computer-readable program code means for determining

correspondence between the position combined with the altitude and the glide path further comprises means for computing the glide path as a function of the airport information [The on board data base provides the angle of the glide slope angle of the specific approach being used. Adding the deviation angle and the glide slope angle yields the actual glide path angle of the aircraft. (Column 4, lines 27-31)]" as claimed.

Regarding claim 22, Wilkens discloses the computer program product of claim 20 "wherein the fourth computer-readable program code means for determining correspondence of the position and altitude with the glide path further comprises computer-readable program code means for retrieving the glide path as one of the plurality of airport information retrieved from the database of airport information [Database 62G provides runway length data and glideslope angle data. (Column 6, lines 39-40)]" as claimed.

Regarding claim 23, Wilkens discloses the computer program product of claim 20 "further comprising sixth computer-readable program code means for interpreting the signal output by the fifth computer-readable program code means as a pattern of color coded indicators on a cockpit display [Display 60 is illustrated as a head up display having an overhead unit portion 60A, a brightness control 60B, and a combiner 60C (also generically referred to as a display screen). (Column 6, lines 9-18)]" as claimed.

Claim 28 recites similar limitations as the method of claim 1, thus is rejected for the same reasons as claim 1.

Claim 29 recites a similar limitation as the method of claim 2, thus is rejected for the same reasons as claim 2.

Claim 30 recites a similar limitation as the method of claim 2, thus is rejected for the same reasons as claim 2.

Claim 32 recites a similar limitation as the system of claim 28, thus is rejected for the same reasons as claim 28.

Claim 33 recites a similar limitation as the system of claim 28, thus is rejected for the same reasons as claim 28.

Claim 34 recites similar limitations as the method of claim 7, thus is rejected for the same reasons as claim 7.

Regarding claim 35, Wilkens discloses the method of claim 34 "wherein updating the deviation over time further comprises repeating the determining of the deviation from the glide path at predetermined intervals [The invention is applicable to most types

of landing systems (The use of the system during landing is predetermined interval) (Column 2, lines 48-49)]" as claimed.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 12, 17-19, 24-27, 31, are rejected under 35 U.S.C. 103(a) as being unpatentable over Wilkens, in view of 4,210,930 to Henry hereafter "Henry".

Regarding claim 12, Wilkens discloses the generator of claim 11.

Wilkens does not expressly teach that the illuminated indicators are positioned on the display to appear in positions consistent with ground-based airport lighting aids as seen on approach as claimed.

Henry teaches a system similar to Wilkens in that they both are systems to help the pilot land the plane in instrument flight. In particular, Henry teaches What is accomplished by the present invention is to develop microwave energy sources which are made to appear as runway lights according to a simulated display on a CRT or image scan within the cockpit of the aircraft. In place of the visible light generated by the runway lights, the pilot will see, instead, the counterpart of such image within the cockpit [Henry: Column 3, lines 21-27]. The systems used are conformal with the VASI as known in the art once the pilot lines the aircraft 10 with the runway 16 according to the image portrayed on the CRT, or heads-up display, whichever is preferred, there comes in view a VASI consisting of a VASI bar 98, and two circular VASI displays 100,102, one on each side of the bar 98 (FIGS. 3,4) [Henry: Column 4, line 64 – Column 5, line 1].

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the conformal display as one would see on the ground as taught by Henry with the system of Wilkens.

The motivation to do so would have been as provided by Wilkens to provide improved synthetic runway symbology for aircraft displays, simplify aircraft navigation, reduce pilot workload, and increase aircraft safety [Column 3, lines 32-35].

Regarding claim 17 Wilkens teaches the generator of claim 14.

Wilkens does not expressly teach that the pattern of indicators further comprises a pattern of indicators that substantially simulates an airport lighting aid as claimed.

Henry teaches a system similar to Wilkens in that they both are systems to help the pilot land the plane in instrument flight. In particular, Henry teaches What is accomplished by the present invention is to develop microwave energy sources which are made to appear as runway lights according to a simulated display on a CRT or image scan within the cockpit of the aircraft. In place of the visible light generated by the runway lights, the pilot will see, instead, the counterpart of such image within the cockpit [Henry: Column 3, lines 21-27]. The systems used are conformal with the VASI as known in the art once the pilot lines the aircraft 10 with the runway 16 according to the image portrayed on the CRT, or heads-up display, whichever is preferred, there comes in view a VASI consisting of a VASI bar 98, and two circular VASI displays 100,102, one on each side of the bar 98 (FIGS. 3,4) [Henry: Column 4, line 64 – Column 5, line 1].

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the conformal display as one would see on the ground as taught by Henry with the system of Wilkens.

The motivation to do so would have been as provided by Wilkens to provide improved synthetic runway symbology for aircraft displays, simplify aircraft navigation, reduce pilot workload, and increase aircraft safety [Column 3, lines 32-35].

Regarding claim 18 the combination as provided regarding claim 17 teaches the generator of claim 17 *supra* wherein the airport lighting aid substantially simulated by

the pattern of indicators is one of a Precision Approach Path Indicator and a Visual Approach Slope Indicator as claimed.

Regarding claim 19 the combination as provided regarding claim 18 teaches the generator of claim 18 *supra* wherein the simulated Visual Approach Slope Indicator further comprises a pointer [bar] portion that is programmed to simulate a vertical deviation scale" as claimed.

Regarding claim 24, Wilkens teaches the computer program product of claim 23.

Wilkens does not expressly teach that the pattern of display indicators simulates a known airport lighting aid as claimed.

Henry teaches a system similar to Wilkens in that they both are systems to help the pilot land the plane in instrument flight. In particular, Henry teaches What is accomplished by the present invention is to develop microwave energy sources which are made to appear as runway lights according to a simulated display on a CRT or image scan within the cockpit of the aircraft. In place of the visible light generated by the runway lights, the pilot will see, instead, the counterpart of such image within the cockpit [Henry: Column 3, lines 21-27]. The systems used are conformal with the VASI as known in the art once the pilot lines the aircraft 10 with the runway 16 according to the image portrayed on the CRT, or heads-up display, whichever is preferred, there comes in view a VASI consisting of a VASI bar 98, and two circular VASI displays 100,102, one on each side of the bar 98 (FIGS. 3,4) [Henry: Column 4, line 64 – Column 5, line 1].

At the time of the invention it would have been obvious to a person of ordinary skill in the art to use the conformal display as one would see on the ground as taught by Henry with the system of Wilkens.

The motivation to do so would have been as provided by Wilkens to provide improved synthetic runway symbology for aircraft displays, simplify aircraft navigation, reduce pilot workload, and increase aircraft safety [Column 3, lines 32-35].

Regarding claim 25 the combination as provided regarding claim 24 teaches the generator of claim 24 *supra* wherein the simulated airport lighting aid further comprises a substantially conformal presentation as claimed.

Regarding claim 26 the combination as provided regarding claim 24 teaches the generator of claim 24 *supra* wherein the simulated airport lighting aid is a Visual Approach Slope Indicator as claimed.

Regarding claim 27 the combination as provided regarding claim 24 teaches the generator of claim 24 *supra* further comprising a seventh computer-readable program code means for interpreting the signal output by the fifth computer-readable program code means as a pointer indicator for simulating a vertical deviation scale on the cockpit display as claimed.

Regarding claim 31 the combination as provided regarding claim 29 teaches the generator of claim 18 *supra*.

Regarding claim 31 Wilkens, teaches the method of claim 29 wherein displaying the deviation further comprises displaying color coded information as to a degree of deviation" as claimed.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. See PTO form 892.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Luke Osborne whose telephone number is (571) 272-4027. The examiner can normally be reached on 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Leo P. Picard can be reached on (571) 272-3749. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

LRO

LEO PICARD
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100